

RODENT-DENUDED AREAS OF THE NORTHERN MOJAVE DESERT

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ABSTRACT.— Populations of pocket gophers and rabbits regulate or control the perennial vegetation on relatively large sites in the northern Mojave Desert. Aboveground shoots are pruned and whole plants are killed by complete cutting of main roots.

In western Mercury Valley and Frenchman Flat on the Nevada Test Site are several areas lacking the normal desert shrub cover.

Figure 1 is an aerial photograph of several such areas in Mercury Valley. The largest shown covers approximately 60 ha.



Fig. 1. Aerial view of rodent-denuded areas in west Mercury Valley, Nevada Test Site. Largest site (arrow) covers about 60 hectares. Highway transects northeast corner of photo.

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Fig. 2. Grazing rabbits severely prune foliage of transplanted shrubs and newly developing seedlings. Inexpensive wire enclosures offer protection and help ensure survival.

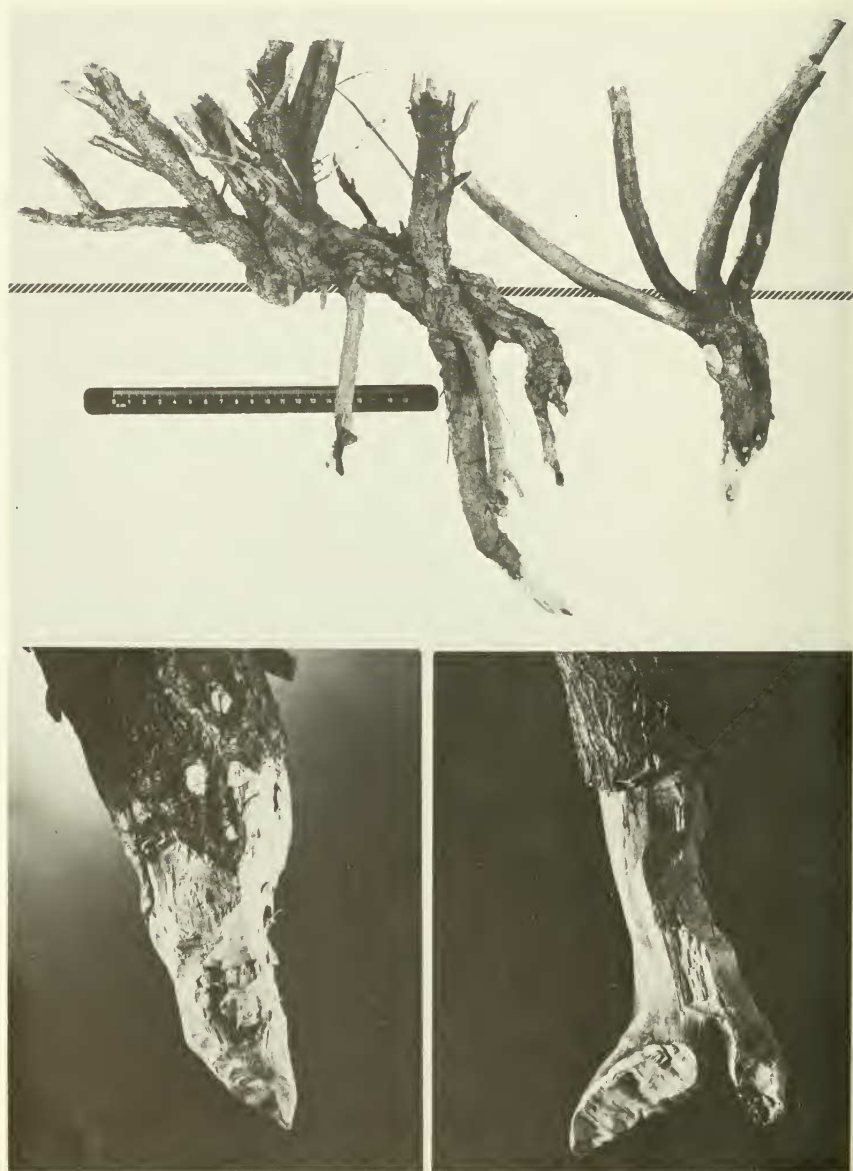


Fig. 3. Example of newly killed *Larrea tridentata* shrubs destroyed by gophers (*Thomomys bottae*).

We have concluded from observations of these areas that they are caused by the activities of burrowing pocket gophers and grazing rabbits. These observations are:

1. The soil surface of the denuded areas is densely pitted with burrow entrances and fresh gopher mounds; the soil is soft, as if freshly plowed; and the surface rocks are uniformly small and retain carbonate deposits, indicating short residence on the surface.
2. Shrubs transplanted onto these areas have been destroyed by severe grazing pressure when left unfenced. Some fenced shrubs also appear to have been killed by burrowing pocket gophers, and nearly all have been pruned to the fences by grazing rabbits (Wallace et al. 1976) (Fig. 2).
3. Dying and recently killed *Larrea tridentata* (Sesse & Moc. ex DC.) Cov. shrubs on the edge of one such area were uprooted, exposing evidence of severe root pruning. The sharp, oblique tooth cuts in healthy wood by pocket gophers (*Thomomys bottae*) were clearly distinguishable from insect damage and decay (Fig. 3).

Further characteristics of these areas are a relatively high population of winter annuals; a gradual transition zone from scattered *L. tridentata* shrubs to a normal shrub community occurring over approximately 20 to 50 meters; and the presence of *Stanleya pinnata* (Pursh) Britt., a small, pithy-stemmed shrub. A few remnant *L. tridentata* shrubs occur within the denuded area, but the absence of standing dead wood indicates the areas have

been bare for at least several decades. Many new shrub seedlings are seen, but survival of seedlings to young, well-established shrubs is extremely rare in these areas.

Although rodent population dynamics have been well characterized in the adjacent shrub communities (O'Farrell and Emery 1976), no studies of rodents have been performed in conjunction with these disturbed areas. Nevertheless, their existence, along with visible evidence, indicates that burrowing and grazing animals play a significant role in plant distribution and soil disturbance in the Mojave Desert. The high density of annuals occurring on these areas may be important to maintenance of the desert rodent populations in dry years (Beatley 1969).

ACKNOWLEDGMENTS

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